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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/595,013	06/16/2000	Thomas Marshall Eubanks	A007699	9819

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EXAMINER

TRAN, LAMBERT L

ART UNIT	PAPER NUMBER
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2144

DATE MAILED: 12/17/2003

15

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/882,817	Applicant(s) OTTUSCH ET AL.	
	Examiner Russell Frejd	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>11</u> . | 6) <input type="checkbox"/> Other: _____ |

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Examination of Application #09/882,817

1. Claims 1-21 of application 09/882,817, filed on 15-June-2001, are presented for examination.

Claim Rejections under 35 U.S.C. § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

3. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The invention claims (claim 1 preamble), "*A computer program product, used in a computer system having a processor, for modeling an electromagnetic response of an arbitrarily shaped three-dimensional object to an arbitrary time-harmonic incident field by means of a well-conditioned boundary integral equation (BIE).*"

4. The Manual Patent Examining Procedure (hereinafter MPEP) provides, in Section 2106(IV)(B)(2)(b), that to be statutory, the invention must be analyzed in view of whether or not it can be classified as a series of steps to be performed on a computer, wherein the steps of the process are evaluated to determine if they perform Independent Physical Acts or Manipulate Data Representing Physical Objects or Activities, in order to achieve a

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practical application; and if not, does the invention merely manipulate an abstract idea or solve a purely mathematical problem without any limitation to a practical application.

MPEP Section 2106(IV)(B)(2)(b)(I) further provides that, in regard to Independent Physical Acts (Post-Computer Process Activity), a process is statutory if it requires physical acts to be performed outside the computer independent of and following the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attribute or structure. Furthermore, the Manipulation of Data Representing Physical Objects or Activities (Pre-Computer Process Activity) defines a statutory process as one that requires the measurements of physical objects or activities to be transformed outside of the computer into computer data, where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities.

5. In view of the foregoing, and other considerations, the Examiner respectfully contends that the claims of the present invention do not meet the criteria established above for a statutory process. The reasoning behind this determination is:

5.1 The claimed invention, "*A computer program product, used in a computer system having a processor, for modeling an electromagnetic response of an arbitrarily shaped three-dimensional object to an arbitrary time-harmonic incident field by means of a well-*

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conditioned boundary integral equation (BIE)”, does not require physical acts to be performed outside the computer, those acts being independent of and following the steps to be performed by the computer, those acts further involving the manipulation of tangible physical objects which result in the object having a different physical attribute or structure. For this reason, the claimed invention does not meet the Independent Physical Acts (Post-Computer Process Activity) requirement.

5.2 Further In regard to independent claim 1, the Examiner respectfully contends that the claims fail to require measurements of physical objects to be transformed outside of the computer into computer data; and thereby do not meet the Manipulation of Data Representing Physical Objects or Activities (Pre-Computer Process Activity) requirement.

5.3 MPEP Section 2106(IV)(B)(2)(b)(ii) provides that a statutory computer process is determined not by how the computer performs the process, but by what the computer does to achieve a practical application with a useful, concrete and tangible result. For example, a computer process that simply calculates a mathematical algorithm that models noise is nonstatutory, while a claimed process for digitally filtering noise employing the mathematical algorithm is statutory. The long line of cases in this area that are referred to in MPEP Section 2106(IV)(B)(2)(b)(ii) exemplify this requirement, by utilizing in the claim language, terms such as controlling, executing, changing and removing. In view of the aforementioned requirement, the Examiner respectfully contends that the claim language of independent claims 1, 8 and 15 do not claim a practical application, that language claiming a method, apparatus, and computer program product for: (in claim 1) **producing** (emphasis

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added) a discretized representation of a well-conditioned BIE to provide a well-conditioned, finite-dimensional linear system, and **solving** the linear system to determine values of the equivalent surface sources.

5.4 For at least these reasons, the Examiner respectfully posits that the claims of the present invention do not meet the criteria for a statutory process. Accordingly, the *computer program product, used in a computer system having a processor, for modeling an electromagnetic response of an arbitrarily shaped three-dimensional object to an arbitrary time-harmonic incident field by means of a well-conditioned boundary integral equation (BIE)*, is determined to be a method consisting solely of mathematical operations, converting one set of numbers (the well-conditioned BIE) into another set of numbers (the values of the equivalent surface sources), whereby the method does not manipulate appropriate subject matter, and thus cannot constitute a statutory process (MPEP Section 2106(IV)(B)(2)(c)).

Claim Rejections under 35 U.S.C. § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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7. Claims 1-3, 8-10 and 15-17 are rejected under 35 U.S.C. § 102(a) as being anticipated by the article, Scalable Electromagnetic Scattering Calculations on the SGI Origin 2000*, authored by J. Ottusch et al..

7.1 Ottusch et al. present the FastScat program for efficiently performing frequency domain electromagnetic scattering calculations using a boundary integral equation formulation on parallel computers [page 1, Introduction]. Typical applications include radar cross section (RCS) prediction, the computation of antenna radiation patterns, and high-frequency circuit package modeling. FastScat uses a Combined Field Integral Equation formulation (CFIE) which when combined with a simple preconditioner and a conjugate solver, keeps the iteration count reasonable [p. 2, Th paragraph].

8. Claims 4-7, 11-14 and 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response Guidelines

9. A shortened statutory period for response to this action is set to expire **3 (three) months and 0 (zero) days** from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see MPEP 710.02, 710.02(b)).

10. Any response to the Examiner in regard to this non-final action should be

directed to: Russell Frejd, telephone number (703) 305-4839, Monday-Friday from 0630 to 1500 ET, or the examiner's supervisor, Kevin Teska, telephone number (703) 305-9704. Any inquiry of a general nature or

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relating to the status of this application should be directed to the
Group receptionist, telephone number (703) 305-3900.

mailed to: Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to: (703) 872-9306

*Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA.,
Sixth Floor (Receptionist).*

Date: 12-December-2003

A handwritten signature in black ink that reads "RUSSELL FREJD". The signature is written in a cursive style with a horizontal line underneath.

RUSSELL FREJD
PRIMARY EXAMINER